

What is claimed is:

1. A telephone applicable to a public switched telephone network (PSTN) and the IP network, comprising:

5 a first interface for transmitting and receiving analog signals over the PSTN;

a second interface for transmitting and receiving packet data over the IP network;

means for communicating with a telephone number
10 translation server connected to the IP network through said second interface when a call is originated by entering a PSTN telephone number and obtaining an IP network telephone number of a destination telephone corresponding to the PSTN
15 telephone number;

means for communicating with a call agent connected to the IP network through said second interface to obtain IP address information of the destination telephone corresponding to said IP
20 network telephone number, and establishing call connection with the destination telephone via the IP network by using the IP address information; and

means for establishing call connection with the destination telephone via the PSTN through said first
25 interface if the IP network telephone number of the

destination telephone corresponding to said PSTN telephone number cannot be obtained from said telephone number translation server.

5 2. The telephone according to claim 1, further comprising means for communicating with said telephone number translation server and registering a mapping of the telephone's own PSTN telephone number and IP network telephone number to the server
10 when the telephone is connected to the IP network.

3. The telephone according to claim 1, wherein, if the entered PSTN telephone number consists entirely of local exchange code and subscriber number, said
15 means for obtaining the IP network telephone number converts the entered PSTN telephone number into a numbering format including a toll number prior to obtaining the IP network telephone number of the destination telephone.

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4. A telephone applicable to a public switched telephone network (PSTN) and an IP network, comprising:

a cache table for storing mappings between PSTN
25 telephone numbers and IP network telephone numbers

of telephones having been called before from the telephone;

means for searching said cache table, when a call is originated by entering a PSTN telephone number, for an IP network telephone number of a destination telephone corresponding to the entered PSTN telephone number, and, if the IP network telephone number of the destination telephone does not exist in the cache table, communicating with a telephone number translation server connected to the IP network and obtaining the IP network telephone number of the destination telephone corresponding to said PSTN telephone number;

means for obtaining IP address information of the destination telephone corresponding to the IP network telephone number obtained from said cache table or said telephone number translation server, from a call agent connected to the IP network and establishing call connection with the destination telephone via the IP network by using the IP address information; and

means for establishing call connection with the destination telephone via the PSTN if the IP network telephone number of the destination telephone cannot be obtained from said cache table and said telephone

number translation server.

5. The telephone according to claim 4, wherein said
means for obtaining the IP network telephone number
5 stores a mapping between the IP network telephone
number of said destination telephone, obtained from
said telephone number translation server, and said
PSTN telephone number into said cache table.

10 6. The telephone according to claim 4, further
comprising means for communicating with said
telephone number translation server and registering
a mapping of the telephone's own PSTN telephone
number and IP network telephone number to the server
15 when the telephone is connected to the IP network.

7. The telephone according to claim 4, wherein, if
the entered PSTN telephone number consists entirely
of local exchange code and subscriber number, said
20 means for obtaining the IP network telephone number
converts the entered PSTN telephone number into a
numbering format including a toll number prior to
obtaining the IP network telephone number of the
destination telephone.

8. A telephone applicable to a public switched telephone network (PSTN) and an IP network, comprising:

a cache table for storing mappings between PSTN telephone numbers and unification identifiers of telephones having been called before from the telephone;

means for searching said cache table, when a call is originated by entering a PSTN telephone number, for a unification identifier of a destination telephone corresponding to the entered PSTN telephone number, and, if the unification identifier of the destination telephone does not exist in the cache table, communicating with a telephone number translation server connected to the IP network and obtaining the unification identifier of the destination telephone corresponding to said PSTN telephone number;

means for requesting a call agent connected to said IP network to establish call connection with the destination telephone via the IP network, based on the unification identifier obtained from said cache table or said telephone number translation sever; and

means for establishing call connection with the

destination telephone via the PSTN if the unification identifier of the destination telephone cannot be obtained from said cache table and said telephone number translation server.

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9. The telephone according to claim 8, wherein, if the entered PSTN telephone number consists entirely of local exchange code and subscriber number, said means for obtaining the IP network telephone number 10 converts the entered PSTN telephone number into a numbering format including a toll number prior to obtaining the IP network telephone number of the destination telephone.

15 10. A call connection control method for connecting a calling telephone, which is connected to a public switched telephone network (PSTN) and the IP network, to a destination telephone, comprising the steps of: communicating with a telephone number 20 translation server connected to the IP network when a call is originated by entering a PSTN telephone number and obtaining an IP network telephone number of the destination telephone corresponding to said PSTN telephone number;

25 obtaining IP address information of the

destination telephone corresponding to said IP network telephone number from a call agent connected to said IP network and establishing call connection between the calling telephone and the destination
5 telephone via the IP network by using the IP address information; and

establishing call connection between the calling telephone and the destination telephone via the PSTN if the IP network telephone number of the
10 destination telephone corresponding to said PSTN telephone number cannot be obtained from said telephone number translation server.

11. The call connection control method according
15 to claim 10, further comprising the step of storing a mapping between the IP network telephone number obtained from said telephone number translation server and said PSTN telephone number into a cache table, wherein

20 when a call is originated by entering a PSTN telephone number, said cache table is searched for the IP network telephone number of the destination telephone corresponding to the entered PSTN telephone number and, if the IP network telephone
25 number of the destination telephone exists in the

cache table, the IP network telephone number is used, if not, the IP network telephone number of the destination telephone is obtained from said telephone number translation server.